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Schwarzschild black hole as particle accelerator of spinning particles

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Abstract

© CopyrightEPLA, 2016.It is shown that in the Schwarzschild background there exists a direct counterpart of the Bañados-Silk-West effect for spinning particles. This means that if two particles collide near the black-hole horizon, their energy in the centre-of-mass frame can grow unbounded. In doing so, the crucial role is played by the so-called near-critical trajectories when the particle parameters are almost fine-tuned. A direct scenario of the collision under discussion is possible with restriction on the energy-to-mass ratio only. However, if one takes into account multiple scattering, this becomes possible 1for as well.

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